

REMARKS/ARGUMENTS

In response to the Office Action dated January 4, 2008, we offer the following submissions and amendments.

Amendments

Claim 5 has been amended to highlight that the printing fluid reservoirs contain printing fluid only and do not define any head space of air. This is described in detail at page 5, line 27 to page 6, line 11. Only when this ink is depleted does the cartridge refill the printing fluid reservoirs by engaging a printing fluid refill source to the refill port on the cartridge body. This is described in detail at the section titled "Ink Refill Cartridge" beginning on page 21.

Accordingly, the amendments do not add any new matter.

Claims - 35 USC§103

Claim 5 stands rejected as obvious in light of US 6,869,166 to Brugue et al in view of US 6,213,600 to Kobayashi et al, in further view of US 4,342,042 to Cruz-Uribe et al.

Amended claim 5 defines the flexible membranes in each of the printing fluid reservoirs can collapse so that the internal volume contains only ink and is constantly sealed from atmosphere. This membrane, together with the sealed refill ports reduce the dissolution of atmospheric gases into the ink, which can later come out of solution and form air bubbles. These bubbles can easily become embolisms that block ink flow through smaller conduits. Given the relatively long, small diameter conduit paths necessary to distribute ink to the entire length of a pagewidth printhead, the issue of air bubble embolisms or 'outgassing' is particularly relevant.

The present invention provides a two level cartridge system in which the printhead cartridge can be refilled with ink when a particular color of ink is depleted, and the entire printhead cartridge can be replaced when nozzle failure or other problems start leaving artifacts in the printed images. This system recognizes that a printer consumable unit (user replaceable cartridge) might itself need consumable units for operation. This offers a good compromise between purchase price, ongoing operating costs and print quality.

As the cartridge may hold its ink for an extended period prior to use (e.g. during shipping and storage prior to purchase), the ink has enough time to dissolve gases from the atmosphere and then bring them out of solution as bubbles due to pressure changes or diurnal heating. The sealed refill ports and lack of any air 'head space' above the stored ink are necessary to control the problems caused by outgassing.

None of the cited references suggest this type of system. The Brugue reference does not describe the 'local reservoir' in the printhead cartridge in any detail. Kobayashi clearly shows an air space above the ink with the storage chambers 68-1, 68-2 and 68-3. Cruz-Uribe has a head space of air above the ink within the secondary reservoir 10, albeit one that can vent to atmosphere via the bleed valve 12. Furthermore, Cruz-Uribe explicitly teaches

away from a sealed refill port during printing. The very object of the Cruz-Urbe arrangement is to provide a secondary reservoir in the supply line from the primary supply to the printhead in order to maintain constant hydrostatic pressure at the nozzles 20.

It is well established that the cited references must disclose all the claim elements in order to support a §103 rejection. The citations fail to disclose any re-fillable printing fluid reservoirs that preclude a head space of air by using a flexible membrane to collapse as the ink is depleted. Accordingly Brugue, Kobayashi and Cruz-Urbe do not anticipate the present invention.

Conclusion

It is respectfully submitted that the Examiner's rejection has been successfully traversed and the application is now in condition for allowance. Accordingly, we request favorable reconsideration.

Very respectfully,

Applicant/s:



Kia Silverbrook

C/o: Silverbrook Research Pty Ltd
393 Darling Street
Balmain NSW 2041, Australia

Email: kia.silverbrook@silverbrookresearch.com

Telephone: +612 9818 6633

Facsimile: +61 2 9555 7762